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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,067	03/22/2006	Kashing Wu	403435	6076
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EXAMINER				
RIPA, BRYAND				
ART UNIT		PAPER NUMBER		
1795				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/541,067

Applicant(s)

WU, KASHING

Examiner

BRYAN D. RIPA

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S5/ICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____
- Paper No(s)/Mail Date ____

DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1-5 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 7,329,313 (hereinafter referred to as "PATENT") in view of Osamu (JP 2001-029747A with reference to machine translation and figures) (hereinafter referred to as "OSAMU") with evidence from Berfield (U.S. Pat. No. 4,547,927) (hereinafter referred to as "BERFIELD").

Regarding claim 1 of the present application, PATENT claims an air cleaning device comprising:

- a body (see col. 5 line 30);
- a filter unit (see col. 5 line 31);
- a photocatalyst reaction unit which generates a spiral air current (see col. 5 lines 32-33);
- a forcible convection unit (see col. 5 line 34); and
- a circuit control unit which can adjustably control operation of the forcible convection unit (see col. 5 line 35-36), wherein
 - o the filter unit is disposed below the body and has a front surface with an opening communicating with the outside and a rear surface in communication with an inlet port of the forcible convection unit (see col. 5 lines 37-40),
 - o the forcible convection unit is disposed between the first filter unit and the photocatalyst reaction unit so the filter unit communicates with the photocatalyst reaction unit (see col. 5 lines 41-44),
 - o the photocatalyst reaction unit includes an air duct, a photocatalyst coating layer disposed on an interior wall of the air duct, two lamp holders, at least one ultra-violet ray tube mounted on the two lamp holders, and a blow guide holder on which a spiral blow guide blade is mounted (see col. 5 lines 45-50),

- ends of the air duct are hermetically connected to left and right side plates of the body respectively (see col. 5 lines 51-52),
- the air duct includes, at a left side, an air inlet port in communication with the air outlet port of the forcible convection unit, in a tangential direction thereof (see col. 6 lines 1-3),
- the ends of each ultra violet ray tube are mounted on the lamp holders and axially disposed inside the air duct (see col. 6 lines 6-7),
- the blow guide holder is located on the left side plate and located at a position of the air inlet port of the air duct (see col. 6 lines 9-11).

PATENT does not claim, however, the blow guide holder including at a right end a plurality of vent holes arranged in a loop and a vent opening in communication with the vent holes at a side wall of the blow guide holder.

This additional structure allows the claimed device of the instant application to require the air flow to spend more time in the photocatalyst reaction unit by requiring the air flow to be redirected back through the reaction unit before exiting the air cleaning device, thereby lengthening the time and overall exposure of the air flow to the photocatalyst reaction unit.

However, OSAMU teaches a photocatalytic air cleaning device with an ultra-violet ray tube that also lengthens the residence time of the gas in the photocatalyst reaction unit by redirecting the flow of the gas back through the reaction unit (see figure 4 and machine translation ¶¶21 and ¶22). Moreover, it would have been obvious to one of ordinary skill in the art at the time of the invention that extending the residence time of

the contaminated gas in the photocatalyst reaction unit would increase the efficiency of the device. As a result, this would require the vent hole or holes for the exiting air to be placed somewhere to the left-hand side of the photocatalyst reaction unit. One of ordinary skill in the art would have appreciated the need to avoid disrupting the flow of the incoming air directed into the photocatalyst reaction unit by the spiral blow guide blade and thus would have recognized the need to place the vent hole or holes on the right-hand side of the blow guide holder so as to not disrupt and interfere with the incoming air.

While OSAMU teaches a single vent hole for the air exiting the photocatalyst reaction unit, it would have been obvious to one of ordinary skill in the art to provide for a plurality of vent holes arranged in a loop as claimed when the vent holes are required to be provided on a cylindrical member where the cylindrical member acts to not only provide a flow path for a gas but also as a support for some structure, as is evidenced by BERFIELD. In BERFIELD the cylindrical member provides support for a fan, not an ultra-violet ray tube as in PATENT; however, one of ordinary skill in the art would have recognized the use of such a configuration to provide for the dual purpose of providing a support for the ultra-violet ray tube as well as a way to provide vent holes for the treated gas to exit the photocatalyst reaction unit.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide for a vent opening in fluid communication with the vent holes on a side wall of the blow guide holder for directing the treated air out of the air cleaning device.

Consequently, one of ordinary skill in the art would have been motivated to increase the efficiency and overall performance of the claimed air cleaner of PATENT by increasing the residence time of the contaminated gas by requiring the gas flow to be redirected back through the photocatalyst reaction unit toward a plurality of vent holes arranged in a loop on the blow guide holder further having a vent opening at a side wall of the blow guide holder in fluid communication with the vent holes.

Allowable Subject Matter

2. Claims 1-5 would be allowable where it not for the above mentioned obviousness-type double patenting rejection. The following is a statement of reasons for the indication of allowable subject matter:

U.S. Patents No. 5,779,912 to Gonzalez-Martin (hereinafter referred to as "GONZALEZ"); 6,761,859 to Oda (hereinafter referred to as "ODA"); 6,238,631 to Ogata (hereinafter referred to as "OGATA"); and U.S. Pub. No. 2003/0021721 to Hall (hereinafter referred to as "HALL") represent the most relevant art.

Regarding claim 1, the cited prior art neither teaches nor fairly suggests a photocatalytic air cleaning device comprising: a body; a filter unit; a photocatalyst reaction unit which generates a spiral air current; a forcible convection unit; and a circuit control unit which can adjustably control operation of the forcible convection unit, wherein the filter unit is disposed below the body and has a front surface with an opening communicating with the outside and a rear surface in communication with an

inlet port of the forcible convection unit, the forcible convection unit is disposed between the first filter unit and the photocatalyst reaction unit so the filter unit communicates with the photocatalyst reaction unit, the photocatalyst reaction unit includes an air duct, a photocatalyst coating layer disposed on an interior wall of the air duct, two lamp holders, at least one ultra violet ray tube mounted on the two lamp holders, and a blow guide holder on which a spiral blow guide blade is mounted, ends of the air duct are hermetically connected to left and right side plates of the body respectively, the air duct includes, at a left side, an air inlet port in communication with the air outlet port of the forcible convection unit, in a tangential direction thereof, ends of each ultra violet ray tube are mounted on the lamp holders and axially disposed inside the air duct, the blow guide holder is located on the left side plate and located at a position of the air inlet port of the air duct, the blow guide holder includes, at a right end, a plurality of vent holes arranged in a loop, and a vent opening in communication with the vent holes at a side wall of the blow guide holder.

More specifically, ODA teaches similar air cleaning devices. In figure 1, ODA shows an air cleaner having a body (main body 1), a filter unit (roll filter 6) disposed within the body, a photocatalyst reaction unit (photocatalyst carrying member 26) having at least one ultra-violet ray tube (lamps 12), a forcible convection unit (air fan 13) which is capable of being adjustably controlled by the circuit control unit (user controls 11). ODA, however, does not teach the forcible convection unit being disposed between the filter unit and the photocatalyst reaction unit. Additionally, the photocatalyst reaction

unit of ODA does not generate a spiral air current and does not comprise an air duct having the photocatalyst coating layer disposed on the interior wall of the air duct.

OGATA, GONZALEZ, and HALL each disclose photocatalytic air cleaning devices that generate a spiral air current. OGATA, in figure 8, shows a photocatalyst reaction unit having a plurality of porous filter plates impregnated with a photocatalyst that would generate a spiral air flow. In figure 2, HALL shows a similar air cleaner with an ultraviolet illumination section (5) having ultra-violet ray tubes (10) and a fan or fixed baffle (9) that can generate a spiral airflow as shown by the arrows in the figure. However, both OGATA and HALL fail to teach having the blow guide holder having a plurality of vent holes arranged in a loop, with the vent holes being in communication with a vent opening in the side wall of the blow guide holder. Moreover, OGATA and HALL neither teach nor suggest the use of a photocatalyst coating layer disposed on the interior wall of the air duct.

On the other hand, GONZALEZ does teach the blow guide holder having a plurality of vent holes arranged in a loop, with the vent holes being in communication with a vent opening in the side wall of the blow guide holder (see figure 1 showing fluid jet 26 with a plurality of centrifugal jets 38 which is in fluid communication with fluid inlet 28). However, GONZALEZ, like OGATA and HALL, does not teach the photocatalyst coating layer being disposed on the interior wall of the air duct but rather on the interior surface of a permeable inner cylinder in a cleaning device that generates a spiral air flow (see figure 1 and 1a).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRYAN D. RIPA whose telephone number is 571-270-7875. The examiner can normally be reached on Monday to Friday, 9:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. D. R./
Examiner, Art Unit 1795

/Brian J. Sines/
Supervisory Patent Examiner, Art Unit 1795